THE CANADIAN SPACE AGENCY

2010-2011 Estimates

REPORT ON PLANS AND PRIORITIES

Minister of Industry

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MINISTER'S MESSAGE

Our government is committed to positioning Canada to exit the current downturn quickly and emerge stronger and more competitive in the global economy. In doing so, Industry Canada and its Portfolio partners will continue to play their key roles in increasing the country's capacity to create jobs and economic growth — for next year and the next decade.

While the recession originated beyond our borders, it had real consequences for Canadians and Canadian business. And despite improving conditions, there is work to be done. In 2010, a major focus will be completing the stimulus measures of Canada's Economic Action Plan (www.actionplan.gc.ca). Introduced in Budget 2009, the Plan's full effect will be felt in 2010-2011, and its measures will help solidify the recovery.

Over this period, Industry Canada and its Portfolio partners will work with industries and sectors hit hardest by the recession. Initiatives will include activities to boost community economic development and to extend broadband infrastructure to underserved or unserved areas across the country. To build on the momentum gained through our past investments in science and technology, significant effort will be directed to shaping the knowledge-based economy.

Industry Canada will also focus on supporting business and industry to capitalize on emerging opportunities at home and abroad. Getting our economic frameworks right, through forward-looking policies, is central to ensuring Canada's place in the global marketplace. We remain committed to two-way trade and investment, which raises our capacity to create jobs and economic growth and provides for sustainable prosperity.

In 2010-2011, the Canadian Space Agency will be committed to developing leading-edge technologies, such as the next-generation Canadarm, to reinforce our country's expertise and leadership in space robotics and to position Canada to play a key role in future international space exploration missions.

I will work with my colleagues, the private sector and other governments to advance the recovery and build the foundation for a strong, competitive economy.

It is my pleasure to present this year's Report on Plans and Priorities for the Canada Space Agency.

Tony Clement,
Minister of Industry

PRESIDENT'S MESSAGE

The Canadian Space Agency is committed to using space to help Government meet the needs of Canadians. For half a century now, the use of space by Canada has evolved from being a tool for scientific research to being a vital infrastructure of the country. Today space technology is critical to observing and monitoring our nation's vast territory, and ensuring communication between communities across Canada.

Innovations being made in space science and technology are helping to position Canada as a leader in the global knowledge economy. Measures taken in Canada's Economic Action Plan are allowing the Agency to develop next-generation technology that will preserve Canada's expertise and leadership in space robotics and ensure Canada's place in future international space exploration partnerships.

In the ongoing pursuit of our mandate, we present this year's Report on Plans and Priorities for the Canadian Space Agency. This document outlines the Agency's main initiatives, priorities and expected outcomes for the upcoming years.

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Steve MacLean,
President

SECTION 1: OVERVIEW

1.1 RAISON D'ÊTRE AND RESPONSIBILITIES

The mandate of the Canadian Space Agency (CSA) is *"to promote the peaceful use and development of space, to advance the knowledge of space through science and to ensure that space science and technology provide social and economic benefits for Canadians".*

The CSA is achieving this mandate in cooperation with other government departments/agencies, industries, and universities, as well as international partners. In addition to delivering its own programs, the CSA is responsible for coordinating all federal civil space-related policies and programs pertaining to science and technology research, industrial development, and international cooperation.

To learn more about the mandate of the Canadian Space Agency, go to:
http://www.asc-csa.gc.ca/eng/about/mission.asp

The Canadian Space Strategy (CSS) approved by the Government of Canada in February 2005 guides the Canadian Space Agency in the management of its programs. The Strategy is instrumental in focusing decision-making at the CSA and aligning all space related program activities through its strategic outcome and long-term priorities.

To learn more about the Canadian Space Strategy, go to:
http://www.asc-csa.gc.ca/asc/eng/resources/publications/default.asp

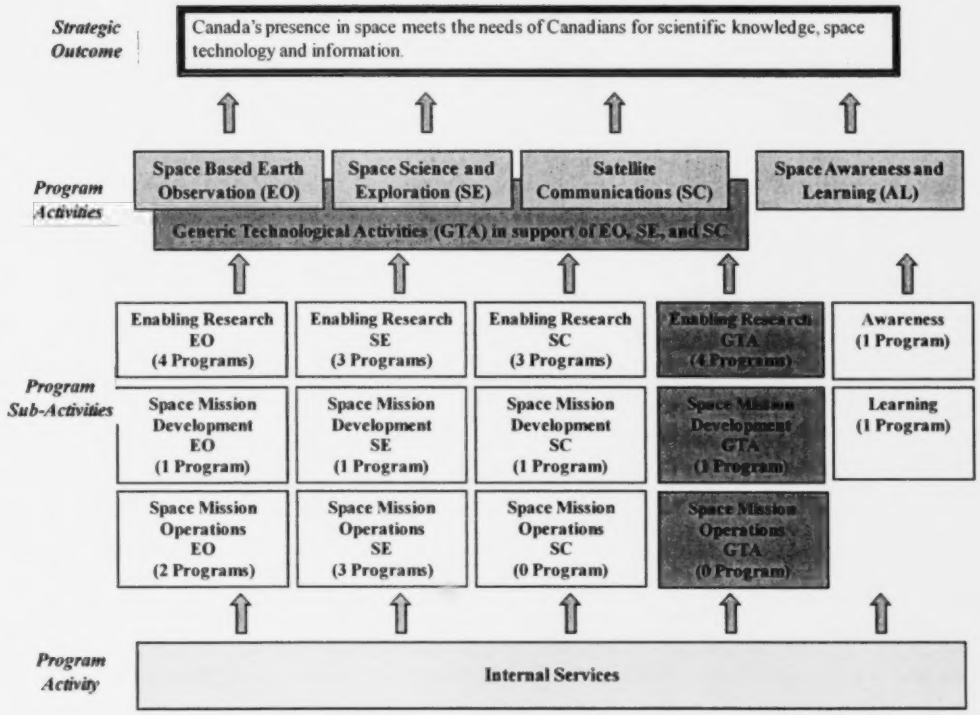
The release in 2007 of the Government's Science and Technology Strategy – *Mobilizing Science and Technology to Canada's Advantage* – provides the CSA with a solid framework with which to prioritise CSA programs and initiatives to "make Canada a world leader in science and technology and a key source of entrepreneurial innovation and creativity".

To learn more about the Canada's Science and Technology Strategy, go to:
http://www.ic.gc.ca/epic/site/ic1.nsf/en/h_00231e.html

CSA Organizational Structure

A new organizational structure will become effective on April 1, 2010. Reporting to the Minister of Industry, the Canadian Space Agency's Executive Officer is the President, assisted by the following executives: Vice-President, four Directors General (Space Utilization, Space Exploration, Space Science and Technology, Corporate Services) as well as the Chief Financial Officer, the Chief Human Resources Officer, and, the Director, Communications and Public Affairs.

1.2 STRATEGIC OUTCOME AND PROGRAM ACTIVITY ARCHITECTURE


Strategic Outcome
Canada's presence in space meets the needs of Canadians for scientific knowledge, space technology and information.
Program Activities
Space Based Earth Observation (EO)
Space Science and Exploration (SE)
Satellite Communications (SC)
Space Awareness and Learning (AL)
Generic Technological Activities (GTA) in support of EO, SE, and SC
Program Sub-Activities
Enabling Research EO (4 Programs)
Enabling Research SE (3 Programs)
Enabling Research SC (3 Programs)
Enabling Research GTA (4 Programs)
Awareness (1 Program)
Space Mission Development EO (1 Program)
Space Mission Development SE (1 Program)
Space Mission Development SC (1 Program)
Space Mission Development GTA (1 Program)
Learning (1 Program)
Space Mission Operations EO (2 Programs)
Space Mission Operations SE (3 Programs)
Space Mission Operations SC (0 Program)
Space Mission Operations GTA (0 Program)
Program Activity
Internal Services

CSA Strategic Outcome: Canada's presence in space meets the needs of Canadians for scientific knowledge, space technology, and information.

Description of Program Activities[1]

Space Based Earth Observation (EO): To develop and operationalize the use of Space Based Earth Observation for the benefit of Canadians, especially in the fields of environment, resource and land use management, as well as security and foreign policy. In doing so, the CSA maintains and expands Canada's leadership in EO technologies to obtain the timely, relevant and essential information we need to make judicious decisions about our collective future.

Space Science and Exploration (SE): To better understand the Solar System and the Universe; expand our knowledge on the constituent elements and origins of life; and strengthen a human presence in space. In doing so, the CSA sustains and increases Canada's contribution to humankind's scientific knowledge, to the exploration of our solar system and the Universe and to the development of related technologies.

Satellite Communications (SC): To provide all Canadians with the means to participate and fully benefit from the global information age. In doing so, the CSA upholds Canada's

[1] Description of Program Activities are taken from the Main Estimates available on line: http://www.tbs-sct.gc.ca/est-pre/estime.asp

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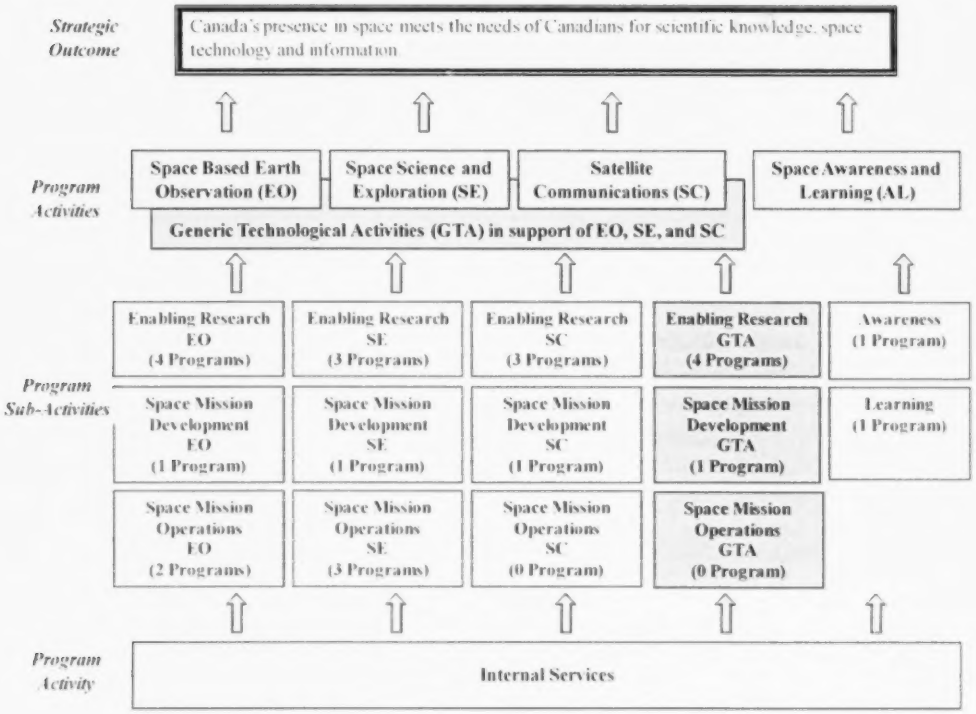
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Program Sub-Activities
Enabling Research EO (4 Programs)
Enabling Research SE (3 Programs)
Enabling Research SC (3 Programs)
Enabling Research GTA (4 Programs)
Awareness (1 Program)
Space Mission Development EO (1 Program)
Space Mission Development SE (1 Program)
Space Mission Development SC (1 Program)
Space Mission Development GTA (1 Program)
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status as a world leader in Satellite Communications and extends the most advanced products and services to all Canadians.

Generic Technological Activities (GTA): To provide leadership, coordination or support to Earth Observation, Space Science and Exploration, and Satellite Communications through activities that are generic in their nature since they contribute to all three program activities.

Awareness and Learning (AL): To further public understanding and engagement with regards to space related issues, ultimately improving the scientific literacy of Canadians by carrying out a national awareness and learning initiative in support of the CSA programs.

Internal Services: To implement the government's commitment to modern public service management in accordance with the Management Accountability Framework's (MAFs) expectations.

1.3 PLANNING SUMMARY

CANADIAN SPACE AGENCY STRATEGIC OUTCOME

Canada's presence in space meets the needs of Canadians for scientific knowledge, space technology and information.

PERFORMANCE INDICATORS

1. Canada's rank in terms of support for peaceful space-related R&D; the measurement will provide the list of CSA missions, looking 10 years into the future and identifying the following for each mission:
   - the CSA's role (leader or partner); and,
   - the CSA's contribution (%) to the total mission budget.
2. State of the scientific, industrial and public sector communities involved in the space sector:
   - number of universities, companies and organizations involved; and,
   - number of people employed in space-related jobs.
3. Access and utilization by the Canadian government and industry of space data generated by Canadian space missions:
   - number of organizations that access/use data generated by Canadian space missions; and,
   - number of federal government employees who access/use such data.

RESOURCES	2010-2011	2011-2012	2012-2013
FINANCIAL ($ in millions)	390.8	378.4	312.7
HUMAN (FTEs)	721.4	722.4	703.7

PROGRAM ACTIVITY ALIGNMENT TO GOVERNMENT OF CANADA OUTCOMES

Program Activity	Forecast Spending 2009-2010	Planned Spending			Government of Canada Outcomes
		2010-2011	2011-2012	2012-2013	
Space Based Earth Observation (EO)	84.2	88.7	108.4	106.2	A Clean and Healthy Environment
Space Science and Exploration (SE)	145.7	185.4	156.1	95.9	A Strong and Mutually Beneficial North American Partnership
Satellite Communications (SC)	17.7	19.7	14.4	11.7	A Safe and Secure Canada
Generic Technological Activities in support of EO, SE, and SC	54.3	46.2	48.4	48.9	An Innovative and Knowledge-Based Economy
Space Awareness and Learning (AL)	9.3	8.1	8.2	8.0	A Vibrant Canadian Culture and Heritage
Internal Services	46.2	42.8	42.9	42.1	Not Applicable
TOTAL	**357.3**	**390.8**	**378.4**	**312.7**	

1.4 CONTRIBUTION OF PROGRAM ACTIVITY PRIORITIES TO THE CSA STRATEGIC OUTCOME

An increasing number of countries are now involved in the peaceful development and use of space. A large number of satellites are expected to be launched in the next ten years. Two-thirds of these satellite projects will serve government programs in Earth Observation and Space Science and Exploration while most of the commercial investments will remain related to Satellite Communications. The Canadian government investments in these three fields are guided by the Canadian Space Strategy in order to meet the needs of Canadians for scientific knowledge, space technology and information.

Canada is at a crossroads where major projects have been delivered and are now operational, while opportunities to collaborate with international partners in major space missions are growing. Major projects that are now fully operational are: RADARSAT-2 Earth observation satellite; Dextre, the two-armed dexterous robot on the International Space Station (ISS); and, the successful flight demonstration of the Ka-band broadband capabilities aboard the Anik F2 communication satellite. These and other remarkable accomplishments, combined with sustained contribution by Canadian astronauts to international space exploration missions, have continued to brand Canada as a science and technology focused reliable trading partner.

In 2008-2009, the CSA undertook a Strategic Review to evaluate its programs and ensure that they continue to meet the needs and priorities of Canadians, are aligned with the Government's Science and Technology Strategy, and are effective and efficient. The evaluation revealed a number of areas where the CSA could make some adjustments:

- Strengthening planning, project management and risk mitigation of complex space projects and missions;
- Renewing the Grants, Contributions and Sponsorship Program and strengthening collaborations with other Granting Councils to leverage CSA investments and expand the partnership between government, academia and space industry;
- Strengthening the use of RADARSAT-2 Earth Observation imaging by Government departments and agencies; and,
- Extending the existing agreement and outstanding collaboration of the CSA and Canada's science and space industry communities with the European Space Agency.

At the same time, the CSA carried out a series of consultations with its stakeholders and partners in order to move forward with renewed impetus to sustain and enhance Canada's space advantage, and contribute to a strong Science and Technology culture.

As a result, a Long Term Space Plan (LTSP) that charts a course for the next ten years has been drafted for presentation to Government for consideration. The Plan highlights the fact that responsibility for the use of space-based assets is diffused in Canada. The overall coordination must rest with the Canadian Space Agency which under the *Canadian Space Act* has the mandate to assist the Minister of Industry in the coordination of space policies and programs of the Government of Canada. The LTSP presents a vision and a direction that address the critical challenges that Canada faces related to the use of space data and information by the Government of Canada to serve its strategic and public policy interests; the sustainability and capacity of its space industry and academia; and, the strengthening of its international partnerships through meaningful and leading-edge contributions.

The CSA will amend its current Program Activity Architecture (PAA) to reflect the new course of actions being presented in the LTSP and will finalize its organizational structure in order to more fully support the new Plan.

Canada's Economic Action Plan

The vision presented in the LTSP combined with additional investments over a three-year period announced in the 2009 Budget under Canada's Economic Action Plan reinforces the Government's commitment towards world-class scientific research and leading-edge innovative technologies by helping sustain and grow Canada's expertise and leadership in space robotics. This support will contribute to Canada's readiness and credibility as a partner for future space robotics projects and also general space exploration. The commitment from the Government will ensure the strategic and effective use of space by Canada in the future. In the long run, Canada's achievements in space will inspire young Canadians to turn to science and choose advanced studies that will allow them to become members of the next space generation.

To learn more about the impact of Canada's Economic Action Plan on CSA Science and Explorations programs, go to: Section 2: Program Activity - Space Science and Exploration

Space Based Earth Observation (EO) Contribution to the CSA Strategic Outcome

Program Activity: Space Based Earth Observation (EO)	**PLANNED SPENDING ($ in millions)**		
	2010-2011	**2011-2012**	**2012-2013**
Ongoing Priority: Develop and operationalize the use of space based Earth observation for the benefit of Canadians.	88.7	108.4	106.2

Earth Observation missions are helping the government deliver on priorities such as protection of the environment, sustainable development, management of natural resources, understanding climate change, monitoring atmospheric constituents and air quality, providing support for disaster management and ensuring the safety and security of Canadians. Canada has been at the forefront of Earth observation data development, management, and exploitation since the 1970s. It is a world leader in satellite operations, synthetic aperture radar data collection, and services (RADARSAT-1 and 2). Moreover, Canada has extended the operation of the SCISAT-1 mission, providing valuable data to the international scientific community. The initiatives described below provide an overview of the planning over the next three years.

Ongoing Initiatives

In the coming years, the CSA will continue its focus on RADARSAT-1 and 2, and SCISAT operations, data management and exploitation. As well, the CSA will focus on the design of national and international next-generation radar satellites, the RADARSAT Constellation and ESA-Sentinel.

The Polar Communications and Weather (PCW) satellite mission will progress. One of its components will provide unique high temporal and spatial resolution data for meteorological, environment, and climate monitoring over the northern circumpolar area.

Emerging Initiatives

An interdepartmental working group is reviewing the Government of Canada space data policy. Clear, supportive and open data policies are needed to facilitate the sharing, integration and dissemination of large volume space data from multiple domestic and foreign sources. The policy also aims at facilitating access to foreign space data for Government departments, academia and industry. The interdepartmental working group, called 'Federated Ground Infrastructure for Satellite Missions' (FGISM), will continue its work to direct Canada's capability to meet future infrastructure requirements.

The CSA is evaluating numerous climate and weather-related concept studies such as: CASS, a CSA-NASA partnership concept that addresses stratospheric ozone and aerosol issues; MEOS, focusing on the measurement of greenhouse gases; SMAP, to measure soil moisture; and, SnowSat to measure precipitation. The CSA is also evaluating international research and engineering projects such as the JC2Sat nano-satellites with Japan and a Canada-Spain-U.S. collaboration on a new Infra Red Sensor Technology.

To learn more about Earth Observation, go to:
http://www.asc-csa.gc.ca/asc/eng/satellites/default.asp?page=observation

Space Science and Exploration (SE) Contribution to the CSA Strategic Outcome

Program Activity: Space Science and Exploration (SE)	**PLANNED SPENDING ($ in millions)**		
	2010-2011	**2011-2012**	**2012-2013**
Ongoing Priority: Understand the solar system and the Universe, expand our knowledge on the constituent elements and origins of life, and strengthen human presence in space.	185.4	156.1	95.9

The CSA helps the scientific community answer fundamental applied science questions and support dynamic space science research activities in the areas of Space Astronomy, Planetary Exploration, Solar-Terrestrial Relations, and Physical and Life Sciences. The CSA selects, develops, and integrates initiatives that offer the most potential for socio-economic benefits. The best ideas, arising from scientific imperatives, are integrated with the technological capacity located within the Canadian industry. The initiatives described below provide an overview of the planning over the next three years.

Ongoing Initiatives

The CSA will continue its international collaboration in important astronomy and planetary exploration missions such as the development of key components of the James Webb Space Telescope, NASA Mars Science Laboratory Mission, and ESA Exomars. The CSA maintains Canada's commitment to the International Space Station (ISS) partnership through the provision of operational, training, logistics support and engineering services for the Mobile Servicing System. The ISS will continue to be used to gain operational experience and to support the development of robotic systems for future space exploration missions. Canadian scientists will take advantage of Canada's allocation on ISS to carry out basic and applied microgravity research on fluid physics, human physiology, and materials processing.

The CSA will continue the development of two innovative Canadian small satellite science missions: the enhanced Polar Outflow Probe (ePOP) suite of instruments onboard the CASSIOPE satellite, and NEOSSat, a joint project with Department of National Defence, for the detection of near earth asteroids and objects. The CSA will support the preparation for use of data from the ESA's Swarm mission and will invest in ground and space-based observations to generate information about the Earth space environment in order to better understand the effects of solar storms on critical space infrastructure.

Emerging Initiatives

Canada will participate to the global strategy for the exploration of the solar system, the two main objectives being the human and robotic exploration of the Moon and a robotic mission to bring critical samples from the surface of Mars. Canada's contribution to the development of mobility platforms (i.e. rovers) and on-orbit servicing are the main focuses of the CSA Stimulus Initiative funded through Canada's Economic Action Plan. These investments will ensure Canada's continuing leadership in robotic contributions to future international space exploration missions and leverage the participation of Canadian astronauts as crew members for future space exploration missions. *To learn more about Space Science and Exploration, go to: http://www.asc-csa.gc.ca/asc/eng/exploration/default.asp*

Space Based Earth Observation (EO) Contribution to the CSA Strategic Outcome

Program Activity: Space Based Earth Observation (EO)	**PLANNED SPENDING** ($ in millions)		
	2010-2011	**2011-2012**	**2012-2013**
Ongoing Priority: Develop and operationalize the use of space based Earth observation for the benefit of Canadians.	88.7	108.4	106.2

Earth Observation missions are helping the government deliver on priorities such as protection of the environment, sustainable development, management of natural resources, understanding climate change, monitoring atmospheric constituents and air quality, providing support for disaster management and ensuring the safety and security of Canadians. Canada has been at the forefront of Earth observation data development, management, and exploitation since the 1970s. It is a world leader in satellite operations, synthetic aperture radar data collection, and services (RADARSAT-1 and 2). Moreover, Canada has extended the operation of the SCISAT-1 mission, providing valuable data to the international scientific community. The initiatives described below provide an overview of the planning over the next three years.

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Program Activity: Space Science and Exploration (SE)	**PLANNED SPENDING** ($ in millions)		
	2010-2011	**2011-2012**	**2012-2013**
Ongoing Priority: Understand the solar system and the Universe, expand our knowledge on the constituent elements and origins of life, and strengthen human presence in space.	185.4	156.1	95.9

The CSA helps the scientific community answer fundamental applied science questions and support dynamic space science research activities in the areas of Space Astronomy, Planetary Exploration, Solar-Terrestrial Relations, and Physical and Life Sciences. The CSA selects, develops, and integrates initiatives that offer the most potential for socio-economic benefits. The best ideas, arising from scientific imperatives, are integrated with the technological capacity located within the Canadian industry. The initiatives described below provide an overview of the planning over the next three years.

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The CSA will continue its international collaboration in important astronomy and planetary exploration missions such as the development of key components of the James Webb Space Telescope, NASA Mars Science Laboratory Mission, and ESA Exomars. The CSA maintains Canada's commitment to the International Space Station (ISS) partnership through the provision of operational, training, logistics support and engineering services for the Mobile Servicing System. The ISS will continue to be used to gain operational experience and to support the development of robotic systems for future space exploration missions. Canadian scientists will take advantage of Canada's allocation on ISS to carry out basic and applied microgravity research on fluid physics, human physiology, and materials processing.

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Satellite Communications (SC) Contribution to the CSA Strategic Outcome

Program Activity: Satellite Communications (SC)	**PLANNED SPENDING** ($ in millions)		
	2010-2011	**2011-2012**	**2012-2013**
Ongoing Priority: Provide all Canadians with the means to participate in and fully benefit from the global information age.	19.7	14.4	11.7

Satellite technologies changed dramatically the world of communications in the 80's. By offering instantaneous global access and global broadcasting, these technologies have begun to erase the notion of distance, bringing remote regions into a global village and enabling new business models based on broadband services, enhanced personal communications, global navigation, and positioning and localization services. The initiatives described below provide an overview of the planning over the next three years.

Ongoing Initiatives

With the launch of Anik F2 in 2004, Canada's rural and remote areas are closer than ever to benefiting from services using broadband (Ka-band) capabilities. One of CSA's main focuses is to optimise the use of the government's Ka-band Capacity Credit by northern communities.

Another priority consists of finalizing the development of Cascade, an experimental high-speed, high-capacity space messaging payload onboard the CASSIOPE satellite, of especial interest to resource exploration firms, industry, and remote research communities.

The Polar Communications and Weather (PCW) satellite mission will progress. Its communications component will provide broadband services all over the northern Canadian area located in the Arctic supporting Canada's sovereignty, security, and economic development. The CSA will continue the development of M3MSat, a joint project with the Department of National Defence, for the Automatic Identification of Ships (AIS).

Canada remains a key partner for ESA's Satellite Communications programs such as Galileo and ARTES.

Emerging Initiatives

The CSA will further investigate how to increase Canada's communications capabilities. Improved satellite communications and additional receiving stations in the Canadian Arctic would enhance Canada's security and sovereignty and better serve the communities. A number of concepts will be studied to support the priorities recently identified by the Government of Canada. Also planned are the next generation communications payloads, such as the Ka/X/Q/V-band, a broadband satellite system, and the use of microsatellites to enhance Canada's sovereignty through maritime surveillance.

To learn more about Satellite Communications, go to:
http://www.asc-csa.gc.ca/asc/eng/satellites/default.asp?page=observation

Generic Technological Activities (GTA) Contribution to the CSA Strategic Outcome

Program Activity: Generic Technological Activities (GTA) in support of EO, SE and SC	**PLANNED SPENDING ($ in millions)**		
	2010-2011	**2011-2012**	**2012-2013**
Ongoing Priority: Provide leadership, coordination or support to EO, SE, and SC Program Activities through activities that are generic.	46.2	48.4	48.9

Generic Technological Activities support all three science and technology program activities by developing high-risk technologies. Efforts are deployed in concert with industry, academia, and not-for-profit organizations. These activities are supported by world-class, cost-effective environmental space qualification testing and services. In consultation with industry and other stakeholders, technology priorities road maps help guide CSA's technology programs. The initiatives described below provide an overview of the planning over the next three years.

Ongoing Initiatives

The CSA encourages industry and the research organizations to propose innovative technologies, which lower risk on the critical technologies required for future missions, and contribute to the enhancement of Canadian capabilities. The CSA uses procurement mechanisms and a new CSA Class Grant and Contribution Program to support Research, Awareness and Learning in Space Science and Technology.

The CSA supports the transfer and commercialization of space technologies and their applications to other sectors of the economy by managing a portfolio of patents and intellectual property licenses, as well as by conducting commercialization assessments.

The CSA ensures the development and maintenance of scientific and technical expertise required to initiate projects and provide support on a matrixed basis to Earth Observation, Space Science and Exploration and Satellite Communications missions.

The David Florida Laboratory continues to support the development of space missions by offering space-qualification services for the assembly, integration, and testing of spacecraft systems for CSA's programs as well as for national and international clients.

Emerging Initiatives

Requests for proposals to be issued by the Space Technology Development Program will be guided by a thorough analysis of future Canadian space missions and technological needs carried out by internal and external experts. The identified future missions/innovative technologies will be identified in long-term roadmaps for space technology development in the following niche areas: Communications Technologies, Sensor Technologies, Robotics, System Engineering Technologies, Platform Technologies and Ground Segment.

To learn more about Generic Technological Activities, go to: http://www.asc-csa.gc.ca/eng/programs/default.asp and, http://www.asc-csa.gc.ca/asc/eng/dfl/default.asp

Satellite Communications (SC) Contribution to the CSA Strategic Outcome

Program Activity: Satellite Communications (SC)	**PLANNED SPENDING** ($ in millions)		
	2010-2011	**2011-2012**	**2012-2013**
Ongoing Priority: Provide all Canadians with the means to participate in and fully benefit from the global information age.	19.7	14.4	11.7

Satellite technologies changed dramatically the world of communications in the 80's. By offering instantaneous global access and global broadcasting, these technologies have begun to erase the notion of distance, bringing remote regions into a global village and enabling new business models based on broadband services, enhanced personal communications, global navigation, and positioning and localization services. The initiatives described below provide an overview of the planning over the next three years.

Ongoing Initiatives

With the launch of Anik F2 in 2004, Canada's rural and remote areas are closer than ever to benefiting from services using broadband (Ka-band) capabilities. One of CSA's main focuses is to optimise the use of the government's Ka-band Capacity Credit by northern communities.

Another priority consists of finalizing the development of Cascade, an experimental high-speed, high-capacity space messaging payload onboard the CASSIOPE satellite, of especial interest to resource exploration firms, industry, and remote research communities.

The Polar Communications and Weather (PCW) satellite mission will progress. Its communications component will provide broadband services all over the northern Canadian area located in the Arctic supporting Canada's sovereignty, security, and economic development. The CSA will continue the development of M3MSat, a joint project with the Department of National Defence, for the Automatic Identification of Ships (AIS).

Canada remains a key partner for ESA's Satellite Communications programs such as Galileo and ARTES.

Emerging Initiatives

The CSA will further investigate how to increase Canada's communications capabilities. Improved satellite communications and additional receiving stations in the Canadian Arctic would enhance Canada's security and sovereignty and better serve the communities. A number of concepts will be studied to support the priorities recently identified by the Government of Canada. Also planned are the next generation communications payloads, such as the Ka/X/Q/V-band, a broadband satellite system, and the use of microsatellites to enhance Canada's sovereignty through maritime surveillance.

To learn more about Satellite Communications, go to:
http://www.asc-csa.gc.ca/asc/eng/satellites/default.asp?page=observation

Generic Technological Activities (GTA) Contribution to the CSA Strategic Outcome

Program Activity: Generic Technological Activities (GTA) in support of EO, SE and SC	**PLANNED SPENDING** ($ in millions)		
	2010-2011	**2011-2012**	**2012-2013**
Ongoing Priority: Provide leadership, coordination or support to EO, SE, and SC Program Activities through activities that are generic.	46.2	48.4	48.9

Generic Technological Activities support all three science and technology program activities by developing high-risk technologies. Efforts are deployed in concert with industry, academia, and not-for-profit organizations. These activities are supported by world-class, cost-effective environmental space qualification testing and services. In consultation with industry and other stakeholders, technology priorities road maps help guide CSA's technology programs. The initiatives described below provide an overview of the planning over the next three years.

Ongoing Initiatives

The CSA encourages industry and the research organizations to propose innovative technologies, which lower risk on the critical technologies required for future missions, and contribute to the enhancement of Canadian capabilities. The CSA uses procurement mechanisms and a new CSA Class Grant and Contribution Program to support Research, Awareness and Learning in Space Science and Technology.

The CSA supports the transfer and commercialization of space technologies and their applications to other sectors of the economy by managing a portfolio of patents and intellectual property licenses, as well as by conducting commercialization assessments.

The CSA ensures the development and maintenance of scientific and technical expertise required to initiate projects and provide support on a matrixed basis to Earth Observation, Space Science and Exploration and Satellite Communications missions.

The David Florida Laboratory continues to support the development of space missions by offering space-qualification services for the assembly, integration, and testing of spacecraft systems for CSA's programs as well as for national and international clients.

Emerging Initiatives

Requests for proposals to be issued by the Space Technology Development Program will be guided by a thorough analysis of future Canadian space missions and technological needs carried out by internal and external experts. The identified future missions/innovative technologies will be identified in long-term roadmaps for space technology development in the following niche areas: Communications Technologies, Sensor Technologies, Robotics, System Engineering Technologies, Platform Technologies and Ground Segment.

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Space Awareness and Learning (AL) Contribution to CSA Strategic Outcome

Program Activity: Space Awareness and Learning (AL)	**PLANNED SPENDING ($ in millions)**		
	2010-2011	**2011-2012**	**2012-2013**
Ongoing Priority: Further public understanding and engagement with regards to space-related issues, ultimately leading to improving the scientific literacy of Canadians.	8.1	8.2	8.0

Through its Science and Technology Strategy, the Government of Canada encourages Canadians to pursue careers in science and technology. The CSA is working with a growing number of partners to enhance public understanding and engagement, especially among youth and their families, through a range of learning and awareness initiatives. Science and technology literacy is a mean to influence young Canadians towards science and technology career choices. The initiatives described below provide an overview of the planning over the next three years.

Ongoing Initiatives

Through a new CSA Class Grant and Contribution Program supporting Research, Awareness and Learning in Space Science and Technology the CSA will enhance the expertise of Canadian scientists, engineers and physicians in space science, space technology and space medicine.

The CSA will continue the solid relationships forged with other government departments, science centres and museums, youth and science associations, the private sector, as well as the education community across Canada through learning activities such as:

- Professional development workshops for educators;
- Partnered initiatives to expand student and educator access to the space science and technology community; and,
- Space-focused learning materials and teaching modules for students at the primary and secondary level.

Awareness activities foster the interest and engagement of Canadians in science and technology by sharing our discoveries and breakthroughs in meaningful ways that communicate their positive impact on the daily lives of Canadians. The major communications activities will focus on the following:

- The long-duration expedition mission to the International Space Station (ISS) by Dr. Robert Thirsk who lived and work more than six months aboard the ISS;
- The launches and operation of Canada's NEOSSat, the world's first space telescope designed to track asteroids, and satellites and debris in the lower Earth orbit; and Canada's M3MSat, which will demonstrate the viability of space-based automatic identification system for maritime traffic monitoring; and,
- The launch and operation of Canada's small hybrid satellite CASSIOPE, which contains the Cascade communications module, and the ePOP science instrument suite.

To learn more about Space Learning and Awareness activities, go to:
http://www.asc-csa.gc.ca/asc/eng/educators/default.asp

Internal Services Contribution to CSA Strategic Outcome

Program Activity: Internal Services	**PLANNED SPENDING ($ in millions)**		
	2010-2011	**2011-2012**	**2012-2013**
Ongoing Priority: Implement the government's commitment to modern public service management in accordance with the MAFs expectations.	42.8	42.9	42.1

Ongoing Initiatives

Based on Management Accountability Framework assessments, Corporate Risk assessments and Internal Audit recommendations, the CSA's main priorities in 2010-2011 are:

- The alignment of program priorities, funding levels, and operations by reviewing the Program Activity Architecture to reflect the new course of actions that will be presented in the Long Term Space Plan;
- The strengthening of accountability by establishing a reviewed governance structure;
- The improvement of management practices by implementing a risk-based approach to project management; and,
- The development and approval of a five-year Evaluation Plan applicable to the CSA 2011-2012 Program Activity Architecture.

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1.5 RISKS ANALYSIS

Strategic Context of the Canadian Space Agency

International Context

Space is recognized by industrialized nations as an essential and strategic tool to meet their social, economic, and foreign policy objectives. Accordingly, many governments around the world of traditional and emerging spacefaring nations are increasing their investments in space activities, looking for increased consolidation and the advancement of their space capabilities.

International cooperation is critical to the implementation of the Canadian Space Strategy. Canada is working in partnership with other spacefaring nations, particularly through its longstanding relations with the National Aeronautics and Space Administration (NASA) and the European Space Agency (ESA). Through these partnerships, Canada can leverage its resources and maximize its return on investment while sharing technical expertise, knowledge, and infrastructure, and gaining access to areas where Canada has chosen not to invest due to limited resources. In addition, there are increasing concerns over issues such as space weather, space debris and climate change. These issues transcend national borders and favour increasing cooperation between nations with common goals. Canada's space infrastructure must not only meet national strategic needs, but must also play a tangible role in responding to issues of interest to the international community.

Canada is regarded as a reliable partner that possesses unique technical and scientific capabilities, and as a nation that can meaningfully contribute to the initiatives of foreign space agencies. In particular, emerging space-faring countries in Asia and South America may offer great potential for future cooperation. Thus, Canada continues to deploy its efforts to gain a foothold in these emerging markets. It is of paramount importance that the Canadian Space Agency continues to work with its stakeholders to ensure the competitiveness of our research and business communities in the world markets. Canada's space industry is perceived as internationally competitive. This was confirmed by the results of the 2008 Annual Survey of the Canadian Space Sector[2]. With yearly revenues of $2,793 billion, $1,405 billion derived from exports, representing 50% of the industry's total revenues. The main destinations of Canadian exports are:

- The United States remains the largest market accounting for 52.1% (or, $733 million) of the $1,405 billion of total exports. Europe falling second, accounting for 28.4% (or, $399.5 million);
- Export revenues from Oceania increased by 7.5% - from $47.6 to $51.2 million;
- Export revenues from South America increased by 63.8% - from $31.8 to $52.1 million; and,
- Export revenues from Africa increased by 71.4% - from $5.4 to $8.9 million.

[2] CSA: State of the Canadian Space Sector 2008; Overall Revenues, Domestic v. Export Revenues.

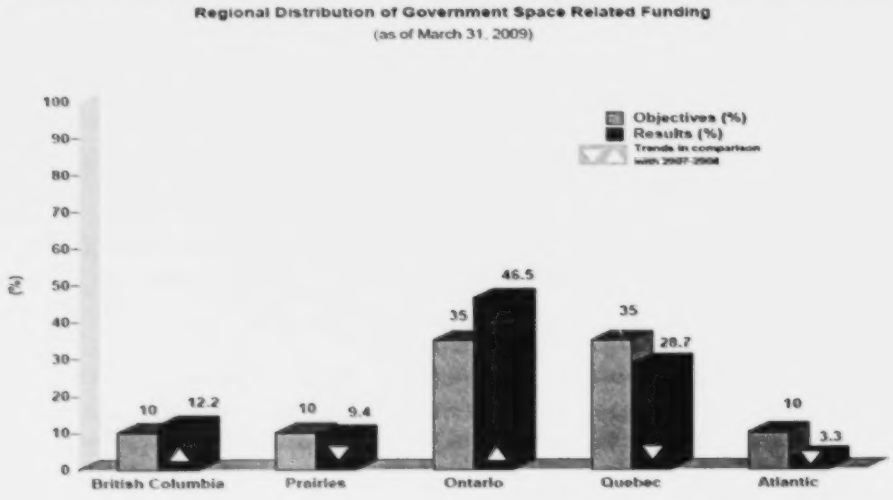
National Context

The Canadian Space Agency recognizes that the best means of turning scientific and technological advancements into innovative products and services is through partnerships with Canadian universities and businesses. With its highly skilled workforce, our space industry not only generates wealth in our economy, but also provides competitive products and services. Given that the national market is relatively small, it is critical that the Canadian space industry be able to leverage foreign investments and generate export sales. Capitalizing on export revenue depends on the industry's ability to commercialize highly competitive products and services, and establish local partnerships.

In 2008, Satellite Communications continued to generate the largest share of Canada's space sector with revenues exceeding those of the previous' year by $314 million (17.1%), from $1,832 billion to $2,146 billion. A breakdown of the total $2,793 billion in revenues by sectors of activity reads as follows:[3]

- Satellite Communications: 76.8% ($2,146 billion);
- Navigation: 9% ($254 million);
- Earth Observation: 7.1% ($200 million);
- Robotics: 4% ($110 million);
- Space Science: 2% ($68 million); and,
- Space-related activities in other areas: 0.5% ($16 million).

Regional Distribution of Government Space-Related Funding From 1988-1989 to 2008-2009



Source: CSA Organized Research Information System (ORIS), March 31, 2009.

[3] CSA: State of the Canadian Space Sector 2008.

While small in terms of the number of firms, the Canadian space sector is knowledge-intensive and is at the forefront of research and innovation. Building on the strengths of 6,742 skilled workers, including 2,189 highly qualified personnel, they have acquired world-leading capabilities in niche areas such as Earth observation, space robotics, communications and navigation satellites.

To learn more about Canadian space-related organizations, go to:
http://www5.asc-csa.gc.ca/eng/industry/csd.asp

Government Context

1- The Canadian Science and Technology Strategy

The objective of the Government Science and Technology (S&T) Strategy is to "make Canada a world leader in science and technology and a key source of entrepreneurial innovation and creativity". In order for Canada to achieve this objective, the S&T Strategy identifies the following three underlining conditions for success: a strong private-sector commitment to S&T, a strengthened knowledge base and, be a magnet for talent. In 2008-2009, the CSA undertook a Strategic Review to evaluate its programs and ensure that they were aligned with the Government's S&T Strategy. As indicated in the Budget 2009 announcement, the CSA will take action to continue to meet the needs and priorities of Canadians.

To learn more about the Canadian Science and Technology Strategy, go to:
http://www.ic.gc.ca/epic/site/ic1.nsf/en/h_00231e.html

2- The Canadian Space Strategy

Approved by the Government of Canada in February 2005, the Canadian Space Strategy was developed in full consultation with Government of Canada organizations and Canadian stakeholders. It is the framework that guides all CSA programs and provides our stakeholders and partners with insight on Canada's strategic directions. While the Canadian Space Strategy preceded the S&T Strategy, it embraces the principles of world-class excellence, and contains a similar set of priorities and innovative national partnerships.

To learn more about the Canadian Space Strategy, go to:
http://www.asc-csa.gc.ca/eng/publications/default.asp#strategy

3- The Long Term Space Plan (LTSP)

In order to move forward with a renewed impetus to sustain and enhance Canada's space advantage, in 2008-2009 the CSA carried a series of extensive consultations with its stakeholders and partners. Stemming from this exercise, a draft Long Term Space Plan is being advanced for consideration by Government with a vision and a direction providing a framework for policy development as well as for the strategic and effective use of space by Canada for the future. The vision is for Canada to make extensive use of space to meet its evolving needs and priorities by building on its remarkable space heritage, and to increase industrial and academic capacity, readiness, and credibility of Canada as a partner for future space exploration missions.

4- Corporate Integrated Planning

In March 2009, the Treasury Board Secretariat directed CSA and other federal departments to implement, by April 1st, 2010, two new policies on investment planning and management of projects. The successful implementation of these policies will help support improved accountability and strengthened management practices at the CSA.

First the *Policy on Investment Planning, Assets and Acquired Services* calls for the development of a multi-year investment plan which demonstrates how the CSA will allocate its human resources, manage the related information and technology, the real property, the infrastructure assets and the acquired services in support of the programs identified in the Program Activity Architecture. Upon successful Cabinet and Treasury Board approval of the Long Term Space Plan, this investment plan will require amendments.

The *Policy on Management of Projects* reflects a risk-based approach to determine project approval limits and Treasury Board oversight. It is based on an assessment of CSA organizational project management capacity and on the assessment of the level of risk and complexity of all projects identified in the CSA's Investment Plan.

5- Corporate Risk Management

The CSA approved the 2010-2011 mitigation action plans developed to address high priority corporate risks.

RISK - INTEGRATION AND IMPLEMENTATION: The CSA's capacity to align its strategies, planning, priorities, funding levels, operations and capacity to deliver, and obtain clear understanding and buy-in from managers and staff at all levels.

Mitigation Action Plan Review: The corporate risk assessment concluded that this risk remains the highest priority. Therefore, mitigation actions such as the following will be pursued in 2010-2011:

- Implement the Long Term Space Plan and develop a change management plan;
- Follow the implementation plan for new Treasury Board policies on Investment Planning, Assets and Acquired Services, and on Management of projects;
- Establish External Advisory committees;
- Establish an Acquisitions Strategy and develop a multi-year Acquisition Plan;
- Develop a CSA Policy on project costs allocation;
- Complete actions in response to external and internal audits on risk management;
- Establish Cost Estimating and Review Team;
- Develop a plan to formalize key corporate processes;
- Consider re-establishing the Committee on Policies and Procedures; and,
- Reorganize Configuration Management and information Management.

RISK – WORKFORCE: The CSA's capacity to hire and maintain a qualified workforce required to deliver its mandate within the government legislative frameworks, policies and rules.

Mitigation Action Plan Review: The corporate risk assessment concluded that this risk remains a high priority. Therefore, mitigation actions such as the following will be pursued in 2010-2011:

- Review Human Resources business processes and work organization;
- Foster use of generic task descriptions and staffing pools;
- Produce career development plans for specialists and integrate them in Human Resources action plans;
- Develop an integrated system to manage departures;
- Implement a corporate strategy in response to the 2008 Public Service Commission Survey;
- Develop and implement a plan to promote the importance of Public Service Values and Ethics; and,
- Update Sector's Human Resources Integrated Plans in line with the 2011-2012 Program Activity Architecture and the CSA reorganization.

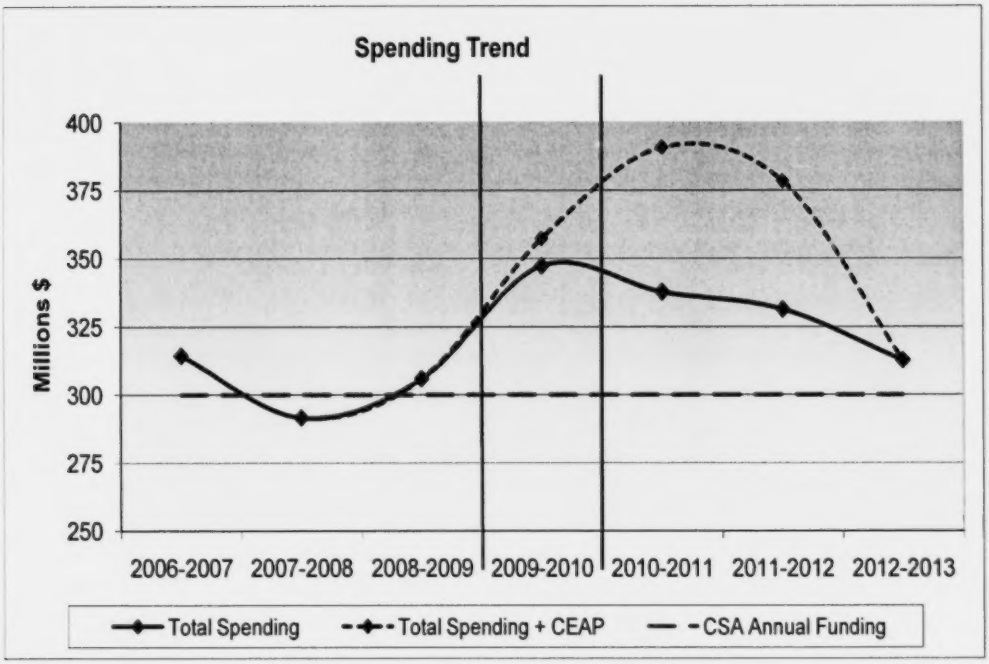
1.6 EXPENDITURE PROFILE

1.6.1 Departmental Planned Spending and Full-Time Equivalents (FTEs)

($ in millions)	Forecast Spending 2009-2010	Planned Spending 2010-2011	Planned Spending 2011-2012	Planned Spending 2012-2013
Space Based Earth Observation (EO)	85.8	**88.7**	108.4	106.2
Space Science and Exploration (SE)	143.3	**185.4**	156.1	95.9
Satellite Communications (SC)	20.3	**19.7**	14.4	11.7
Generic Technological Activities (GTA) in support of EO, SE, and SC	53.8	**46.2**	48.4	48.9
Space Awareness and Learning (AL)	8.9	**8.1**	8.2	8.0
Internal Services	43.0	**42.8**	42.9	42.1
Budgetary Main Estimates (gross)	355.1	**390.8**	378.4	312.7
Non-Budgetary Main Estimates (gross)	0	**0**	0	0
Less: Respendable Revenue	0	**0**	0	0
Total Main Estimates	355.1	**390.8**	378.4	312.7
Adjustments [1]:				
Supplementary Estimates				
Operating Carry Forward	9.7			
Implementation Initiative (Budget 2009)	15.0			
Capital Carry Forward	0.0			
Collective Agreements Compensation	6.2			
Expenditure Strategic Review	(1.4)			
Reimbursement of eligible pay list expenditures	0.8			
Reinvestment of royalties from the sale of RADARSAT-1 data	0.0	**4.1**	4.1	4.1
ARLU				
Reprofiling of Funds	(28.1)			
Total Adjustments	2.3			
Total Planned Spending	357.3	**394.9**	382.5	316.8
Full-Time Equivalents	662.7	**721.4**	722.4	703.7

Notes:

1. Adjustments are to accommodate approvals obtained since the Main Estimates and include Budget Initiatives, Supplementary Estimates, etc.
2. Due to rounding, decimals may not add up to totals shown.



The CSA's annual A-Base Budget of $300 million was established in 1999. The difference in the spending trend shown above is mainly attributable to the following factors:

- The cumulative impact of the reprofiling of funds associated with the sound management of high-risk projects and programs (e.g., high technology risks, long-term development cycle, uncertainties with work schedules, implementation delays).
- The incremental funds for the RADARSAT Constellation Project allocated in Budget 2005 providing the CSA with additional $111 million over five years (2005-2006 to 2009-2010) to work with the Canadian space industry on the development of the next generation of advanced radar remote sensing satellites.
- In Budget 2009, Canada's Economic Action Plan (CEAP) provided the CSA with an additional $110 million over three years for the development of prototypes of a lunar exploration rover, a Mars science rover, and next-generation space robotics systems and technologies for on-orbit servicing. The two main objectives of this initiative are the preservation of Canadian expertise and leadership in space robotics, and increasing Canada's readiness and credibility as a partner for future space robotics projects and for space exploration.

1.6.2 Voted and Statutory Items

Vote or Statutory Item	Truncated Vote or Statutory Wording	2009-2010 Main Estimates ($ in millions)	**2010-2011 Main Estimates** ($ in millions)
25	Operating expenditures	208.0	**252.3**
30	Capital expenditures	90.1	**81.4**
35	Grants and contributions	47.1	**46.3**
(S)	Contributions to employee benefit plans	9.9	**10.8**
	Total Agency	**355.1**	**390.8**

SECTION 2: ANALYSIS OF PROGRAM ACTIVITIES BY STRATEGIC OUTCOME

Program Activity: Space Based Earth Observation

Program Activity Priority: The program activity objective is to develop and operationalize the use of space Earth Observation (EO) for the benefit of Canadians, especially in the fields of environment, resource and land use management, as well as security and foreign policy.

SPACE BASED EARTH OBSERVATION (EO) PROGRAM ACTIVITY PERFORMANCE MEASUREMENT	
Expected Result #1	**Performance Indicators**
The benefits of activities involved in Earth Observation from space serve Canadian users in the fields of environment, resource and land-use management, and security and sovereignty.	1. Proportion of active missions relative to the total number of missions supported by Canada in the three EO priority areas. 2. Number of applications developed that have reached an operational stage as a result of CSA's participation in space missions or support to projects or activities in EO. 3. Number of concrete uses/utilizations as a result of CSA's participation in space missions or support to projects or activities in EO.
Planning and Reporting Continuity: RPP 2009-2010 and DPR 2008-2009: http://www.asc-csa.gc.ca/asc/eng/resources/publications/default.asp#parliament	

RESOURCES	2010-2011	2011-2012	2012-2013
FINANCIAL ($ in millions)	88.7	108.4	106.2
HUMAN (FTEs)	62.9	56.7	58.6

Summary of the Planning Highlights for Space Based Earth Observation

- Through the Earth Observation Application Development and the Government Related Initiatives Programs, the CSA will continue satellite data application development and use to support the growth of Earth observation capabilities within the Canadian government departments and the service industry.

- Canadian departments will continue to take advantage of the many capabilities offered by RADARSAT-1 and 2 as new applications become operational. The CSA will continue to manage the $445 million worth of prepaid data allocation to ensure that maximum benefits are realized, following the RADARSAT-2 Data Utilization Management Plan.

- The CSA will continue to develop the RADARSAT Constellation mission, to meet the Canadian Government needs, particularly for maritime surveillance, disaster management and ecosystem monitoring. A Preliminary Design initiated in 2008 is expected to be completed by March 2010.

- Through the Atmospheric Science Program, the CSA will support the production and use of space-based observations of atmospheric gases and aerosols in improving climate and weather models.

Benefits for Canadians

Earth observation missions drive many of the changes that are improving our quality of life by helping our government deliver on priorities such as protection of the environment, sustainable development, management of natural resources, understanding climate change, monitoring air quality, and providing support for disaster management. For instance, space based Earth observation enables monitoring of the environment with unparalleled coverage and scope, enhancing our forecasting capabilities and our understanding of environmental systems. Earth observation data are used for sustainable management and development of natural resources, land use, fisheries and agriculture.

EO missions are also critical to security and sovereignty, offering cost-effective, wide-area surveillance of land and maritime environments that are difficult to access, such as coastal approaches and the Northwest Passage.

The list of governmental users of EO data includes Environment Canada, Fisheries and Oceans Canada, the Canadian Ice Service, Natural Resources Canada, the Department of National Defence, and the provinces and territories.

To learn more about the Earth Observation Program Activity, go to:
http://www.asc-csa.gc.ca/asc/eng/resources/publications/default.asp#parliament

Program Activity: Space Science and Exploration

Program Activity Priority: The program activity objective is to better understand the Solar System and the Universe; expand our knowledge on the constituent elements and origins of life; and strengthen a human presence in space. In doing so, the CSA will sustain and increase Canada's contribution to humankind's scientific knowledge, to the exploration of our solar system and the Universe and to the development of related technologies.

SPACE SCIENCE AND EXPLORATION (SE) PROGRAM ACTIVITY PERFORMANCE MEASUREMENT	
Expected Result #1	**Performance Indicators**
Participation in Canadian and international missions expands the scientific knowledge base made available to Canadian academia and R&D communities in the areas of astronomy, space exploration and solar-terrestrial relations, as well as in physics and life sciences.	1. Proportion of active missions relative to the total number of missions supported by Canada in the SE priority areas. 2. Number of scientific instruments and technological applications developed as a result of CSA's participation in space missions or support to projects or activities in SE. 3. Number of peer-reviewed papers produced in academia and the R&D community in Canada recognizing CSA's support through its participation in space missions and support to projects and activities in SE.
Planning and Reporting Continuity: RPP 2009-2010 and DPR 2008-2009: http://www.asc-csa.gc.ca/asc/eng/resources/publications/default.asp#parliament	

RESOURCES	2010-2011	2011-2012	2012-2013
FINANCIAL ($ in millions)	185.4	156.1	95.9
HUMAN (FTEs)	225.9	220.8	204.2

Summary of the Planning Highlights for Space Science and Exploration

- More than half of the $110 million envelope allocated by Canada's Economic Action Plan will be spent in 2010-2011 on two projects: Exploration Surface Mobility (ESM) and Next Generation Canadarm (NGC). ESM will develop and/or improve prototypes comprising hardware and software components of Lunar Exploration Rover focusing in utilitarian tasks and on light mobility tasks and on the Mars science rovers to collect sample and perform scientific investigation. The NGC will deliver prototypes of the next generation space robotics systems to be used in Earth, Lunar or Martian orbit for the servicing of international space exploration spacecraft, or of the next generation satellites.

- The CSA will continue to support the International Space Station (ISS) assembly and maintenance operations and will initiate operational use of Dextre as a new element to effect repairs on the ISS. In return, the CSA expects to be able to fully exploit the long-term access to this unique space environment as a platform for microgravity research with such missions as: BISE, a neuroscience study of perception; APEX-Cambium, which examines the role of gravity in the formation of "tension wood"; BCAT-5, which will lead to improved understanding of crystal growth in colloids components of many industrial processes; and VASCULAR, a study of the effects of spaceflight on the structure and function of blood vessels.

- The CSA will maintain a healthy, trained and versatile Astronaut Corps and professional support team to meet the needs of Canadian space science and human exploration programs. The CSA will continue its involvement in projects with operational relevance that address current and future needs in space medicine in order to understand, quantify and mitigate or eliminate medical risks associated with human space flights.

- Through the new CSA Class Grant and Contribution Program to support Research, Awareness and Learning in Space Science and Technology, the CSA will continue to support the development of science and technology, to foster the development of a critical mass of researchers and highly qualified people in Canada in areas relevant to the priorities of the Canadian Space Agency.

- The CSA and the Department of National Defence are partnering to manage the NEOSSat mission, a combination of Near Earth Space Surveillance (NESS) and High Earth Orbit Surveillance (HEOS) projects. It is expected that 50% of NEOSSat time will be used to observe the inner portion of the solar system to discover, track and study asteroids and comets. The other 50% of the operating time will be used to track satellites in high-Earth orbit to update the orbit parameters of known satellites flying over the Canadian territory. The NEOSSat spacecraft will undergo manufacture, assembly, integration and testing activities during 2010-2011 in order to be ready for launch towards the end of the fiscal year.

Benefits for Canadians

In today's context of environmental change and resource depletion, space science and technology developments for space exploration have great potential to bring about socio-economic benefits that will improve how we live, prosper, and evolve on our planet.

With the *Economic Action Plan*, the government of Canada reinforced its vision and commitment towards world-class scientific research and leading-edge innovative technologies. For the space community this translates into a $110 million envelope for the CSA *Stimulus* initiative to be contracted-out to Canadian industries, with the possibility of sub-contracts to universities. The two main objectives of this initiative are the preservation and growth of Canadian expertise and leadership in space robotics, and the increased readiness and credibility of Canada as a partner for future space robotics projects and general space exploration. Space exploration, science, and technology endeavours, which often involve international partners, will continue to put the CSA in a favourable position to build strong and mutually beneficial partnerships with an increasing number of space faring countries. The space community is essential to the prosperity of global commerce and the safety of Canadians through the peaceful use of space.

To learn more about Space Science and Exploration Program Activity, go to:
http://www.asc-csa.gc.ca/asc/eng/resources/publications/default.asp#parliament

Program Activity: Satellite Communications

Program Activity Priority: The program activity objective is to provide all Canadians with the means to participate and fully benefit from the global information age.

SATELLITE COMMUNICATIONS (SC) PROGRAM ACTIVITY PERFORMANCE MEASUREMENT	
Expected Result #1	**Performance Indicators**
State-of-the-art systems and applications are developed to satisfy the needs of the Canadian government and population in order to ensure that Canada remains a world leader in satellite communications.	1. Proportion of active missions relative to the total number of missions supported by Canada in the SC priority areas. 2. Number of technological applications developed as a result of CSA's participation in space missions or support to projects and activities in SC.
Planning and Reporting Continuity: RPP 2009-2010 and DPR 2008-2009: http://www.asc-csa.gc.ca/asc/eng/resources/publications/default.asp#parliament	

RESOURCES	2010-2011	2011-2012	2012-2013
FINANCIAL ($ in millions)	19.7	14.4	11.7
HUMAN (FTEs)	13.6	11.6	11.7

Summary of the Planning Highlights for Satellite Communications

- The CSA will work to optimise the use of the Government of Canada capacity credit for broadband telecommunications services in the North. Additional demonstration of Ka-band technology will improve the use of the Anik F2 by northern communities for trials of innovative services by government departments. The next step consists of securing the authorities required to proceed with the large scale deployment and utilization of the Government of Canada Ka-band Capacity Credit for the benefit of the northern communities.
- The CSA will complete the assessment of the requirements of the Canadian government users and will continue to elaborate the concept for a polar satellite system as part of a joint study with Department of National Defence and Environment Canada. The Concept of the Polar Communications and Weather Mission aims at putting a constellation of satellites in a highly elliptical orbit over the Northern Hemisphere to monitor weather and climate change, and provide communication services in the Arctic region. The weather component of the mission falls within the Earth Observation program activity, while the polar communication falls within the Satellite Communication program activity.

- In 2004-2005, as part of the CASSIOPE Mission Contribution Program, the CSA initiated the development and demonstration of the Cascade telecommunications payload on a small satellite spacecraft. Cascade is the precursor of a communication satellite constellation that will help position Canadian industry on the international market, both as a supplier of advanced components and as a service provider of high-volume, high-data-rate tele-communications anywhere in the world. This small satellite is fully designed and constructed by Canadian companies. The launch is scheduled for 2010.

- The CSA and the Department of National Defence (DND) are partnering to manage M3MSat micro-satellite project which is based on an Automatic Identification System (AIS) payload. This project will demonstrate and further develop a multi-mission micro-satellite bus capability; will establish micro-satellites as operationally cost effective, will allow optimization of the AIS payload in maritime traffic identification, and will be complementary to CSA's RADARSAT Constellation program and to DND's Polar Epsilon program. Detailed design will be finalized and manufacturing will start in 2010-2011. The launch is planned for March 2011 and the mission demonstration should end in 2013.

- The CSA will continue to do research and development activities in the area of search and rescue in order to support the next-generation of satellite-based Middle Earth Orbit Search-and-Rescue (MEOSAR). The objective is to use navigation satellites such as GPS and Galileo to relay in near real-time signals from activated distress beacons located in ships, plane or on a single individual needing help.

Benefits for Canadians

Satellite Communications facilitates the linking of all Canadians by increasing the delivery of non-commercial services to Canadian remote communities, and support federal government department's program delivery. The Government of Canada capacity credit will be instrumental in this endeavour.

Space infrastructure allows access and dissemination of timely health, cultural, educational, security and safety-related information to all Canadians wherever they live in Canada. Satellite communications are essential to provide Canadians living in remote areas with timely access to expert knowledge and expertise related to health and education through a range of non-commercial services including: e-government, e-learning, tele-justice, tele-education, as well as tele-medicine in areas such as tele-psychiatry, tele-radiology, tele-surgery, and tele-consultations.

Satellite communications missions are also critical to the security and sovereignty of Canada, offering cost-effective, broadband capabilities to Canadian Forces and Cost Guard over land and maritime environments that are difficult to access, such as in the Arctic, coastal approaches and the Northwest Passage.

To learn more about Satellite Communications Program Activity, go to:
http://www.asc-csa.gc.ca/asc/eng/resources/publications/default.asp#parliament

Program Activity: Generic Technological Activities in support of Earth Observation, Space Science and Exploration, and Satellite Communications

Program Activity Priority: Provide leadership, coordination or support to Earth Observation, Space Science and Exploration, and Satellite Communications through activities that are generic in their nature since they contribute to all three program activities.

GENERIC TECHNOLOGICAL ACTIVITIES (GTA) IN SUPPORT OF EO, SE, AND SC PROGRAM ACTIVITY PERFORMANCE MEASUREMENT	
Expected Result #1	**Performance Indicators**
Canada's industrial technological capabilities can meet the needs of future space missions and activities.	1. Ratio of the number of priority technologies identified for future EO, SE and SC missions and the number of priority technologies developed in GTA. 2. Number of priority technologies supported that are ready to be used.
Planning and Reporting Continuity: RPP 2009-2010 and DPR 2008-2009: http://www.asc-csa.gc.ca/asc/eng/resources/publications/default.asp#parliament	

RESOURCES	2010-2011	2011-2012	2012-2013
FINANCIAL ($ in millions)	46.2	48.4	48.9
HUMAN (FTEs)	120.4	131.1	131.8

Summary of the Planning Highlights of Generic Technological Activities

- Through contracts and contributions, the Space Technology Development Program will encourage industry and research organizations to propose innovative technologies, retire risk on the critical technologies required for future missions of Canadian interest, and contribute to the enhancement of Canadian capabilities.
- The David Florida Laboratory will be upgraded in order to continue to provide world-class and cost-effective environmental space qualification services for the assembly, integration and testing of spacecraft systems to CSA's programs, as well as national and international clients. The CSA intends to make its research facilities more accessible and available to academia and the Canadian space industry.

- The CSA ensures the development and maintenance of Canadian scientific, technological and engineering expertise required to deliver current and future Canadian Space Programs. This collaborative effort is formalized under grants, contributions, national and international partnership agreements, or contracts. The activities are mainly carried out by Canadian academia and industry, through leadership by the CSA, with the participation of granting agencies, government departments, foreign space agencies, not-for-profit organizations, and provincial governments.

- The CSA ensures the development and maintenance of scientific and technical expertise required to initiate projects and provide support on a matrixed basis to Earth Observation, Space Science and Exploration and Satellite Communications missions.

Benefits for Canadians

Through its R&D investments and the resulting transfers of applications to the private and public sectors, the CSA's programs and activities attract highly educated and highly skilled labour that contributes to Canada's knowledge-based economy, helps enhance the Canadian space industry's competitiveness by encouraging dynamic trade relationships with other nations, and increases Canada's ability to compete in the global marketplace.

To learn more about Generic Technological Activities Supporting Earth Observation, Space Science and Exploration, and Satellite Communications Program Activity, go to: http://www.asc-csa.gc.ca/asc/eng/resources/publications/default.asp#parliament

Program Activity: Internal Services

Program Activity Priority: To implement the government's commitment to modern public service management in accordance with the Management Accountability Framework's (MAFs) expectations.

INTERNAL SERVICES PROGRAM ACTIVITY PERFORMANCE MEASUREMENT	
Expected Result #1	**Performance Indicators**
Internal Services provide an added value to CSA managers in the performance of their duties.	1. Internal Services provided meet standards set under government-wide policies. 2. CSA's rating against MAF criteria based on Round VII assessment.
Expected Result #2	**Performance Indicator**
The highest priority risks identified in the CSA corporate risk profile are addressed and mitigated.	1. Mitigation action plans are implemented against the corporate risks identified as highest priorities.
Planning and Reporting Continuity: RPP 2009-2010 and DPR 2008-2009: http://www.asc-csa.gc.ca/asc/eng/resources/publications/default.asp#parliament	

RESOURCES	2010-2011	2011-2012	2012-2013
FINANCIAL ($ in millions)	42.8	42.9	42.1
HUMAN (FTEs)	269.9	273.3	269.3

Summary of the Planning Highlights for Internal Services

- In order to align the CSA's strategies, planning priorities, funding levels, and operations, once approved by the government, the Long Term Space Plan will be integrated in the corporate finance, work planning, performance measurement, and human resources planning information systems for the 2011-2012 fiscal year.
- In order for the CSA to have its management practices meet the standards set by the Government wide policies, the following actions will be undertaken in 2010-2011:
  - The final review of the Program Activity Architecture and the Performance Management Framework that will support for the implementation of the Long Term Space Plan in 2011-2012;
  - The review of the governance structure and corporate risk management framework; and,
  - The development and approval of a five-year Evaluation Plan applicable to the 2011-2012 Program Activity Architecture.

SECTION 3: SUPPLEMENTARY INFORMATION

3.1 FINANCIAL TABLES

The annexes are linked to the Report on Plans and Priorities 2010-2011 posted on the Treasury Board of Canada Secretariat Web site at: http://www.tbs-sct.gc.ca/est-pre/estime.asp

Annexe 1: Details on Transfer Payment Programs (TPPs)

Annexe 2: Internal Audit and Evaluations

Annexe 3: Sources of Respendable and Non-Respendable Revenue

Annexe 4: Status Report on Major Crown Projects (MCPs)

Annexe 5: Summary of Capital Spending by Program Activity

Annexe 6: User Fees

3.2 CSA CONTRIBUTIONS TO GOVERNMENT OF CANADA OUTCOMES

This information is linked to the Report on Plans and Priorities 2010-2011 in the detailed document "Analysis of Program Activities by Strategic Outcome - *Detailed Performance Information*" in Section 3: Supplementary Information, posted on the Canadian Space Agency's Web site at:
http://www.asc-csa.gc.ca/asc/eng/resources/publications/default.asp#parliament

3.3 INDEX OF CSA SPACE MISSIONS

This information is linked to the Report on Plans and Priorities 2010-2011 in the detailed document "Analysis of Program Activities by Strategic Outcome - *Detailed Performance Information*" in Section 4: Index, posted on the Canadian Space Agency's Web site at:
http://www.asc-csa.gc.ca/asc/eng/resources/publications/default.asp#parliament